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ABSTRACT

Education is the process of changing the behavior patterns of people. Educational objectives represent the kinds of behavior alterations that an educational institution wishes to bring about in its students. Administrators must be trained in the technique of organizing instruction that most successfully advances the educational goals of the school. This paper concentrates on the instructional objective technique of organizing instruction in the context of an administrator training program. (Author)

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INSTRUCTIONAL OBJECTIVES IN ADMINISTRATOR TRAINING

Division A

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Instructional Objectives in Administrator Training

In educational circles, education has come to mean something more than the education of the young--education has become the process of changing the behavior patterns of people. This broader definition will bring under the heading of education the retraining of the unemployed, adult education, and postgraduate work. When education is viewed in this way, it is clear that educational objectives, then, represent the kinds of alterations in behavior that an educational institution wishes to bring about in its students.

If this is to be the goal of education--to bring about desired changes--then it becomes obvious that there are many ways of organizing instruction to accomplish this goal. Administrators are going to have to be trained in the techniques of organizing instruction that most successfully produces the educational goals of the school. This paper will concentrate on the instructional objective technique of organizing instruction. The various members of the educational world are concentrating on this method as being the most effective one of teaching a subject matter irregardless of the field involved. We will now outline the instructional objective technique in the context of an administrator training program.

1. Organizing Instruction

The technique used for selecting content for training programs for administrators implies that the instruction will be organized in a particular manner. Because it relates to the learning and retention of behavior, the method is directed toward the students' acquisition of the behavior necessary in his particular administrative role. The behavioral contingency (adapted from J. R. Millenson's book Principles of Behavioral Analysis) can be used to describe a system which could be established to train administrators. Symbolically the contingency is represented by this paradigm:

$$\left[\begin{array}{l} S \text{ (stimuli - instructional materials)} \\ R \text{ (desired behavior)} \end{array}\right. \xrightarrow[\text{(contingencies)}]{} S^r \text{ (reinforcers)}$$

The desired responses (R) are results of the stimulus (the materials at hand in the training sequence). The responses are influenced and controlled by the available reinforcement (S^r) contingencies in the particular training situation. The knowledge and skills acquired in the training situation are carried over into the school setting and the student's behavior is influenced by the reinforcement contingencies in his actual administrative role.

In the case of a school child this three term contingency could be shown as follows:

S - child is given spelling quiz
R - child gets 95% right ⟶ S^r child gets 10 minutes of free playtime

In the case of an administrator the same principle would operate,

S - administrator is given spot test
R - administrator gets 95% correct ⟶ S^r administrator is allowed to skip next section of material

We will discuss briefly each part of this paradigm using standing forms and some actual examples. Later on we will discuss decision rules and procedures for the management of data which will make the instructional system outlined operable over the long run.

Now, to return to our paradigm; the behavior desired (R) can be described in terms of instructional objectives stated for the administrators. In general, there has been little emphasis placed on how the administrators are to accomplish their objectives or what their functions actually are thought to be. No one has attempted to describe what types of behavior are required by administrators to operate and direct the school program. If the administration is to serve to manage and support the instructional program in the schools, then it is crucial for us as administrators and researchers to attempt to identify those behaviors which assist the administrators to become more effective in their roles.

Traditionally, objectives have been stated in terms of content to be covered or in terms of some cognitive activity on the part of the learner such as 'understand' 'master' or 'conceptualize'. As Tyler pointed out some years ago, such objectives do not specify what it is that the learner is to do so that he can demonstrate the results of instruction, hence the need for specifying instructional objectives in terms of administrator behavior so that reliable assessment can be made of his progress.

The behaviors specified in the functional analysis of administrator's roles become the curriculum for the training program. These behaviors can be cast in the form of instructional objectives which outline for the student and his instructor what is to be learned in terms of administrative behavior. Each objective must contain certain characteristics (Mager). These characteristics are shown below:

a) the conditions under which the behavior is to occur must be clearly stated.
Example: 'Given a sequence of events in school construction with associated time estimates for completion,'

b) the behavior of the student must be specified in observable terms. Example: ' . . . the student is to construct a PERT chart and compute the critical path . . .'

c) the level of performance which constitutes acceptable mastery of the behavior must be noted. ' . . . with no loops in the final chart and all critical events on the computer path.'

From the functional analysis, groups of objectives can be drawn which constitute the content of the training course. Given varied administrative roles, special groups of objectives could be designed which related to the specific skills desired in each type of administrative role. The objectives for a given program should be keyed to the subject matter and any other related training experience (such as an observation session). Then, based on the learning of these objectives in actual training test situation, the sequence which best promoted acquisition could be selected. Since in a field like administration

there is no logical sequence of objectives, some sort of format for sequences of instructional objectives must be designed. The figures below give a format by which a record may be kept of each objective in the particular program and an example of an objective.

Figure 1

A Card Format for Instructional Objectives

Objective Number: (a unique number which identified sequence and content area)

Objective: (stated as above containing required behavior, stimuli, and measurement)

Materials: (a listing of materials which have proved to be effective in demonstrating the objective)

Test Items: (test items which have shown close correlation to behavioral performances)

Obj. No. 03001
instruction objectives

List the criteria for an instructional objective.

Materials: Tyler, Basic Principles of Curriculum & Instruction
Mager, Stating Instructional Objectives

Test Item: An instructional objective is complete when it tells what the child is to do and when he is to do it. False

An instructional objective embodies a test procedure to determine the performance of the student. True

Control over teacher behavior is an important feature of the instructional objective. True

2. Materials of Instruction

The materials selected for the training setting must fit the functional analysis mentioned earlier. They must also relate to the administrative setting, the skills and knowledge required in that setting, and the measurement of those skills. In other words,

they must be related to the administrator's job and his behavior (and its consequences) on the job. The stimulus materials must be selected with an eye toward what particular behavior is desired and what objectives must be accomplished to achieve that objective. The materials must be so designed that they demonstrate and elicit the correct responses from the student.

Each particular instructional objective presents a program in learning. These learning problems can be categorized (Gagné, 1965 p. 55) into six categories:

a) response differentiation: stimuli are discriminated and behavior is brought under control of specific stimulus events.

b) association: a specific stimulus evokes an associated response such as assignment of a name to the stimulus.

c) multiple discrimination: identification of detailed differences among stimuli and associating a particular response with each.

d) behavior chains: a particular stimulus initiates a specific series of responses which terminates in some identifiable outcome.

e) class concepts: identification of a stimulus as a member of a larger class of stimuli.

f) principles and strategies: identification of stimuli as appropriate for specific responses or series of responses. Chaining two or more concepts.

Each of the above categories suggests certain instructional materials or special stimuli. For example, if a behavior chain - such as the preparation of instructional objectives - were being taught, then the material must be structured in such a way that the learning problem progresses in steps to the end of the chain. Here, the definition of an instructional objective might be the first item in the chain and the designing of several objectives the end of the chain. In this case the end event would also be a reinforcing event. The final event in the chain could also be used as the beginning item in the chain - to set the boundaries of the learning problem and to provide a tool for elaborating the various steps in the whole process.

When the objective card format described earlier is used, the instructional materials must be keyed to the objectives for use by students at the appropriate time. The materials must be managed by the instructors in such a fashion that they are readily available for the students involved in the training.

3. Management of Instruction: Contingencies & Reinforcement

It becomes obvious that in a system like this, numerous test items must be designed to spot check (and reinforce) students' progress. These test items must be keyed to the instructional objectives which are in turn keyed to the materials so that if a student misses a particular item he can be directed right back to the appropriate material.

The major difference between a system of instructional objectives and a traditional course is that each student enters the system at a different point and progresses at his own rate as he acquires new behaviors. It is vital to design a management system which can make entrance at different points possible as well as variable rates of progression. More will be said about this management system shortly.

First, however, a few words must be said about reinforcement and contingency management since, obviously, a system like this requires that when a student successfully completes a contingency, he must be reinforced. Reinforcement in school is traditionally received in the form of grades, in degrees, and in gratification at obtaining the correct answer. In an instructional objective sequence which has numerous objectives, reinforcers must be discovered which relate to the behavior learned and to the administrator's role in real life. Premack's principle is highly relevant here; "For any pair of responses, the most probable one will reinforce the less probable one." Stated in terms of child behavior this might mean to Johnny (age 8) that if he does his spelling words correctly, he may decide what game the class will play during recess.

However, contingencies have to be established that have meaning for administrators. It is one thing to tell an eight year old that if he sits still for 15 minutes, he may go play on the jungle-gym for 10 minutes and to tell an administrator the same thing

(there are many school administrators, however, who just might wish to be confronted by that contingency)! Meaningful types of reinforcement must be devised to use in addition to grades - which at the graduate level often don't have a great deal of meaning. A more appropriate reinforcement would be to make an internship position available to a potential administrator upon successful completion of the entire course. Another possibility could be an opportunity for a student to design with the instructor (Keller & Associates - Ferster & Perrott, 1968) the next activity for his collegues in a given curriculum. Here, the reinforcement would be the social interaction between student and instructor. The greater the number and variety of reinforcers available, the more likely it is that each trainee will attempt to acquire the appropriate behavior stated by the contingencies.

In order to help develop the link between the training situation and the real world of the administrator, the instructional manager must emphasize reinforcers that relate to the real world situation. This could be done by a series of reinforcers which would help phase the student from the training situation into the real situation. For example, if the student mastered the beginning set of instructional objectives in a course on school business management, he could observe some school business managers at work. As his skill increases he could perhaps simulate a part of a school budget; and finally, once he had completed the entire sequence, he could be put in charge of generating a part of a school budget. In any case, the rewards must not only be related to achieving the desired behavior but also must help insure the transfer of training from school to reality.

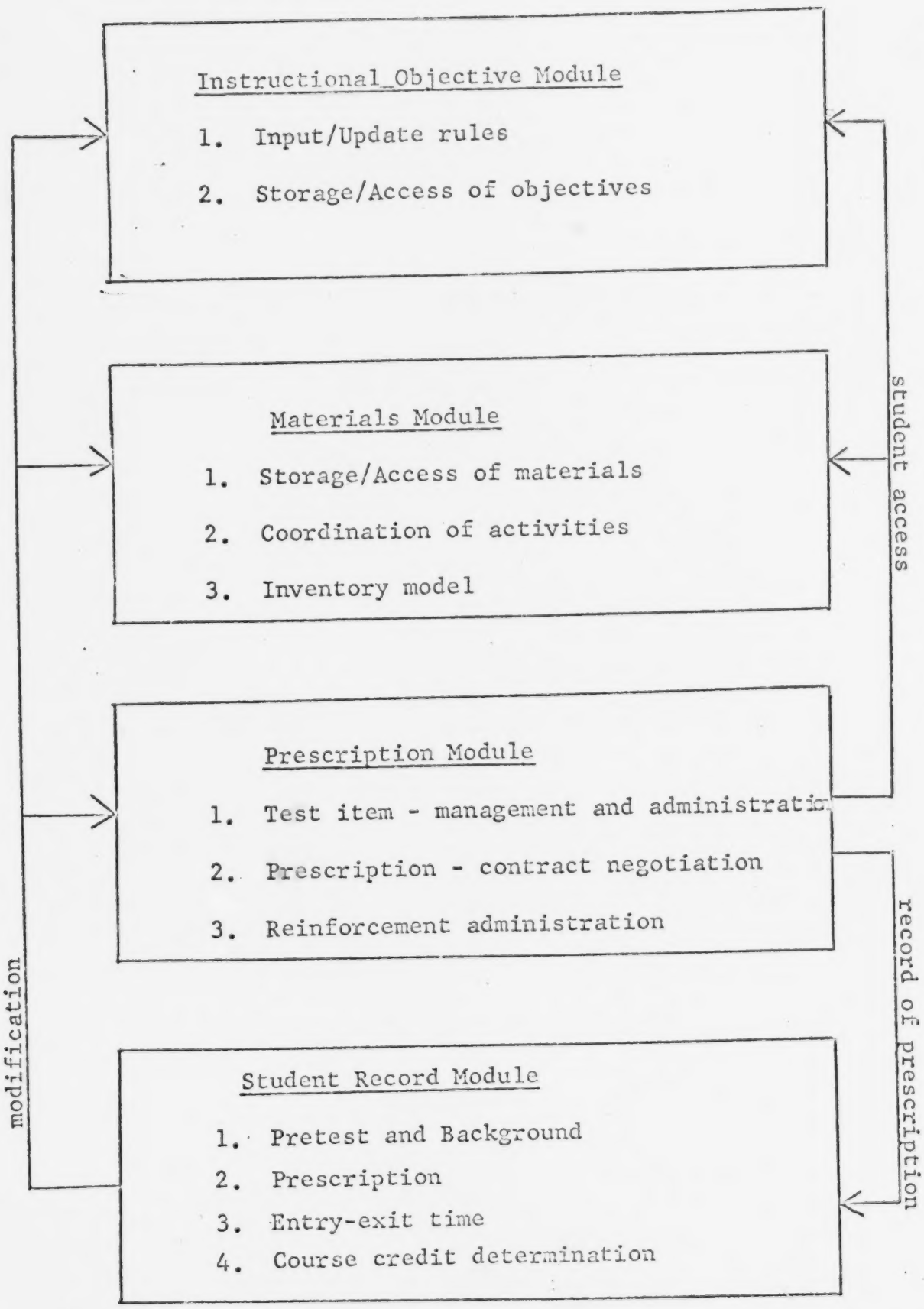
From the viewpoint of management requirements, the major characteristic of the instructional system described is the need for decisions relevant to each student. Operations and procedures concerning instructional objectives, learning materials, student progress and reinforcement must be geared to individual learning problems and different rates of acquisition.

A modular management information system is proposed to satisfy the necessary functions of a) data collection, b) monitoring student progress, c) providing prescription information, and d) diagnosing student learning problems (Cooley and Glaser).

It is intended to clarify the relationships of the instructional objective components and to identify the problems in any developing individualized instruction program. It also could pave the way for an automated, computer managed system.

Basically, it consists of four modules - 1) the Instructional Objective module, 2) the Learning Materials module, 3) the Prescription module, and 4) the Student Record module. Each unit contains decision rules or tables and all but the Student Record module contain storage of some instructional objective component. The four modules operate parallel in the time dimension (a student interacts with all four continuously) and interact with each other through feedback loops.

Figure 2


Instructional Objective Module
1. Input/Update rules
2. Storage/Access of objectives
Materials Module
1. Storage/Access of materials
2. Coordination of activities
3. Inventory model
Prescription Module
1. Test item - management and administrati
2. Prescription - contract negotiation
3. Reinforcement administration
Student Record Module
1. Pretest and Background
2. Prescription
3. Entry-exit time
4. Course credit determination
modification
student access
record of prescription

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1. Instructional Objective Module

The Instructional Objective module is primarily responsible for the storage/access of instructional objectives. These objectives are on call singly or more commonly in groups of fixed sequence, partly because a majority of possible instructional objective sequences are nonsensical and partly to reduce the remaining possibilities to a workable magnitude. The I.O. module also contains guidelines for new instructional objectives or the modification of existing objectives; these guidelines, or input decision rules, are intended to weed out inappropriate objectives, to ensure instructional objectives which meet instructional objective requirements (Mager), and to elicit a list of instructional materials and test items for newly developed instructional objectives.

After the instructional objective and its components are given an identification code, the unit is recorded for storage using the card format illustrated in figure 1 (the materials and test items for a new objective are then stored by their respective modules).

An evaluation/modification component of the module updates the objectives and the allowable sequences. For example, two classes in an educational administration course were assigned different sequences of objectives, and then compared for mean gain scores from pretest to post test to determine the best sequence of instructional objectives.

The I.O. module depends on the Student Record module for inputs to it's evaluation/modification component and on the Prescription module for inputs which determine student access to stored objectives.

2. Learning Materials Module

The Learning Materials module houses the storage/administration of instructional materials, the management of instructional activities (e.g., internships in an outside organization), and an upgrading system for the materials and activities. The administration of materials for a department responsible for a dozen or more training programs is quite demanding. It requires a sophisticated fluid parts inventory system (Ackoff & Sasieni, Fundamentals of Operations Research) which uses enrollment projections and constant update inventorying to maintain an adequate supply of materials, to requisition

depleted items, and generally to minimize waiting time for students requesting instructional materials.

Modification of materials and activities involves the comparison of alternative materials/activities for the same objective. This does not mean that one set of materials best matches an objective for all individuals. Just as the objectives themselves will vary according to type of learning problems (Gagné, 1965), they present the student; so some other learning difficulties may be encountered, each of which responds best to different materials treatment for the same objective.

This module requires input from the Student Record module for the modification function and from the Prescription module for information on student access to materials and activities.

3. Prescription Module

The crucial management decisions which individualize the instructional program are part of the Prescription module. The decision rules which prescribe specific instructional objectives and appropriate reinforcements are incorporated into the prescription formulae; these relate pretest and background deficiencies to instructional sequences which will bring the behavioral performance to the acceptance level. (Data from the Student Record module is continually monitored to improve the predicting success of the prescription tables.) Negotiations between instructor and student for optional instructional objectives and additional reinforcements is a part of the prescription process.

The prescription is then recorded in the Student Record module for further administration, while the Prescription module is responsible for management of the reinforcements. Pretest and post test item development, storage and administration are responsibilities of the Prescription module principally because of their essential part in the diagnostic process.

4. Student Record Module

The last module has been repeatedly mentioned in the role of supplying information through modifying loops. The heart of the Student Record module is an immediate-updating

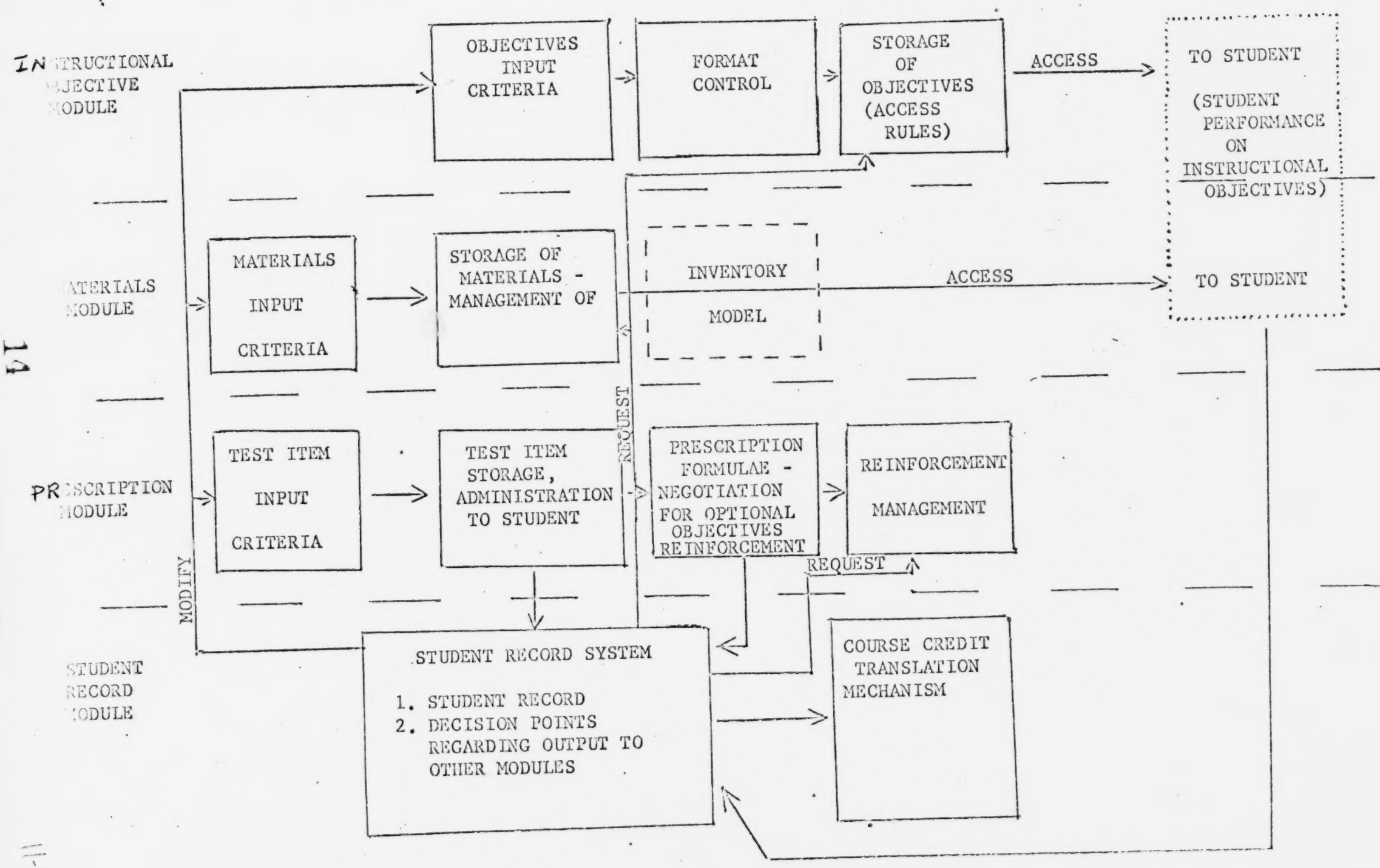
record system that notes background variables, pretest results, prescription-contract (including reinforcements), entry and exit times for instructional objectives, task evaluations, and post test results. When the prescription is recorded, decision points are identified by the format. Later, when the student progresses to the decision point the record system automatically recognizes this and makes the proper decision. For example, recording the completion of the last objective in a sequence and the results of a post test signals a decision point. Depending on the performance level, a specific reinforcement (part of the prescription-contract) may be requested of the Prescription module, a new sequence of objectives and materials may be requested of the Instructional Objective and Materials modules, or a new prescription may be requested.

Management of data for evaluation and modification routines is handled by this module. Some information automatically goes to specific functions in different modules; for special research problems requests are submitted to the record system.

It has become apparent that individualized instruction is hard to evaluate for credit in a traditional course-credit system. A work-to-credit translation is highly desirable, and it should be administered by the Student Record module.

Briefly, then, the four modules separate the major management functions concerning objectives, materials, student record, and prescription. Each module has within it a storage/access model, evaluation/modification routines, and decision tables related to its major function. Between modules there are communication channels for coordination, requisition, and modification. The management information module system is thus basically an attempt to expose the relationships of management needs in an individualized instruction system.

Figure 3


INSTRUCTIONAL OBJECTIVE MODULE
OBJECTIVES INPUT CRITERIA
FORMAT CONTROL
STORAGE OF OBJECTIVES (ACCESS RULES)
ACCESS
TO STUDENT
(STUDENT PERFORMANCE ON INSTRUCTIONAL OBJECTIVES)
MATERIALS MODULE
MATERIALS INPUT CRITERIA
STORAGE OF MATERIALS - MANAGEMENT OF
INVENTORY MODEL
ACCESS
TO STUDENT
REQUEST
PRESCRIPTION MODULE
TEST ITEM INPUT CRITERIA
TEST ITEM STORAGE, ADMINISTRATION TO STUDENT
PRESCRIPTION FORMULAE - NEGOTIATION FOR OPTIONAL OBJECTIVES REINFORCEMENT
REINFORCEMENT MANAGEMENT
REQUEST
MODIFY
STUDENT RECORD MODULE
STUDENT RECORD SYSTEM
1. STUDENT RECORD
2. DECISION POINTS REGARDING OUTPUT TO OTHER MODULES
COURSE CREDIT TRANSLATION MECHANISM

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